

SECTION 6 (15.00 - 15.45): Integrated Product Development

The whole product is more than the sum of its parts!



DTU Management Engineering
Department of Management Engineering

6th Section - Learning objectives

To be able to:

1. **Describe** the difference between Sequential and Integrated Product Development (IPD)
2. **Identify** the important stakeholders involved in the development of a product
3. **Name** the 3 key disciplines in IPD
4. **Analyse** a simple product in terms of the three main disciplines of IPD

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EXERCISE - Example

Using as **few** of the numbers as possible:

6 1 7 8 2 5

Using these functions: +, -, x, /, (,)

Make or get as close as you can to: =

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EXERCISE 1a

Using as **few** of the numbers as possible:

6 7 4 1 6 4 8

Using these functions: +, -, x, /, (,)

Make or get as close as you can to: =

Make or get as close as you can to: =

Make or get as close as you can to: =

Cross out the numbers used

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Exercise 1b Integrated development

Using as **few** numbers as possible, what can the product developers do with the following:

6 7 4 1 6 4 8

Marketing wants: =

Stylists want: =

Manufacturers want: =

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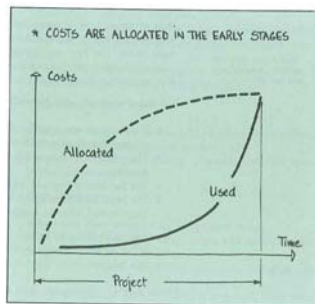
Does this really apply to product development



- Constraints imposed by design decisions cause compromise for other stakeholders
- Product development is greatly complex
- Nobody knows how a product is developed
Even a simple product like a pencil!

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Project cost allocation



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EXERCISE 2:

List the stakeholder activities involved in the development of a Pharma product.



Some important stakeholder activities in the development of the iPhone:

- Engineering
- User / Operators
- Shipping / Distribution
- Sales / Retailing
- Purchasing
- Quality control
- Assembly
- Disposal
- Manufacturing
- Suppliers

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The three Key disciplines of Integrated Product Development (IPD)



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The three Key disciplines of Integrated Product Development (IPD)



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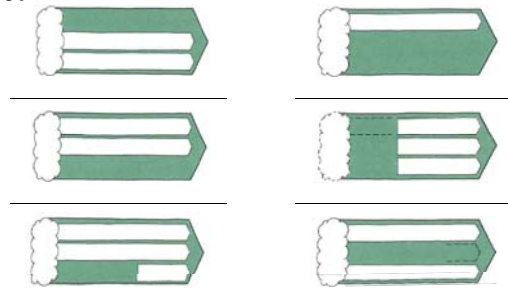
"Integrated Product Development is:

an **idealised model** of development where the **business case** of a product is built from the **perspectives** of **all stakeholders**"

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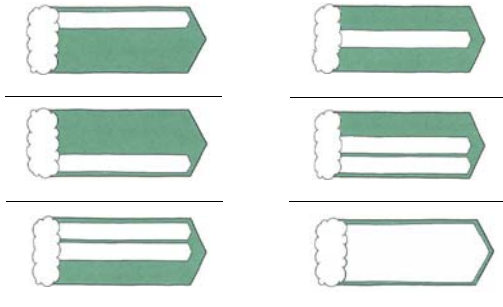
Exercise 3a:

What are the associated Pharma Business types...



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Exercise 3b: What are the associated Pharma Individual types...





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2 Products with the same task...



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Analyse the sample in terms of the key disciplines of IPD

		
Market	High end, premium, brand differentiation	Functional mid range, better perception
Product	Relatively complex, several parts, better quality, more clean, easier to direct	Simple easy to use and cheap, more messy, more difficult to use
Production	Difficult manufacture, assembly & customisation	Very simple 1 piece moulding

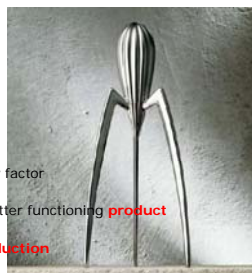
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Which product is better?



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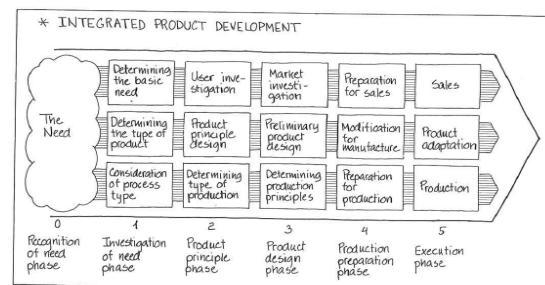
Extreme cases...



- ✗ No **market** differentiation or wow factor
- ✓ Lighter, more sturdy, cheaper, better functioning **product**
- ✓ Cheaper, quicker and easier **production**

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The IPD model



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The link between Product and Market

Customer relationship modelling



Case study 1

The initial project brief:

*“To design **quick release security screws** for **small paintings**.”*

Clive Stevens (Managing Director) of Euronova.

Defining a market

- In the UK last year there were 42 thefts from Museums and Galleries from about 2,700 organisations.
- In probability terms this works out at a 1:60 chance of a theft from a single organisation per year.
- The pattern of crime has **migrated from night-time and fraud, to snatches during open hours**. 64% of thefts were from displays during the day.

Whose market?



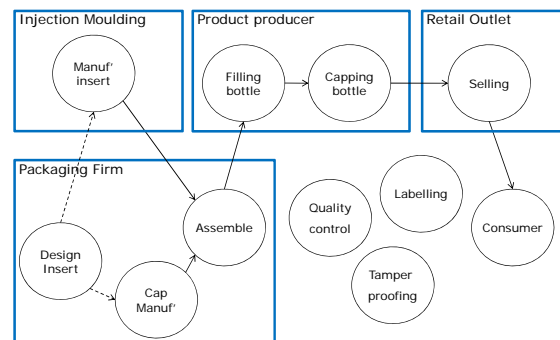
The link between Product and Production

Supply chain modelling



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Supply chain modelling



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What are DFX methods?

DFX: Design For X

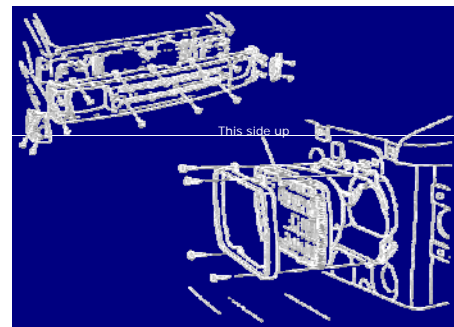
- where 'X' is an important aspect related to the product lifecycle,
- and 'Design For' means to design the product in order to improve

Important DFXs:

- DFE – Design for the Environment
- DFM – Design for Manufacturability
- DFA – Design for Assembly
- DFS – Design for Serviceability
- DFC – Design for Changeover
- DFD – Design for Disassembly
- DFQ – Design for Quality (QFD method)

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Think about service in advance... Headlamp bulb replacement example



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Here's what it takes...

Disassemble:

- 2 Screws (left side light)
- Cover (left side light)
- Cable connector
- Housing (left side light)
- 2 Screws (right side light)
- Cover (right side light)
- Cable connector
- Housing (right side light)
- 14 Screws (radiator panel)
- Radiator panel
- 4 Screws (headlamp trim)
- Headlamp trim
- Headlamp glass
- Headlamp bulb

32 items

Reassemble:

- Headlamp bulb
- Headlamp glass
- Headlamp trim
- 4 Screws (headlamp trim)
- Radiator panel
- 14 Screws (radiator panel)
- Housing (right side light)
- Cable connector
- Cover (right side light)
- 2 Screws (right side light)
- Housing (left side light)
- Cable connector
- Cover (left side light)
- 2 Screws (left side light)

32 items

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Boeing Helicopter (formerly McDonnell Douglas Helicopter Systems)

Apache Longbow Helicopter Redesign



Estimated savings
\$1.3 billion over life of program

One aircraft per month now -
increasing to five per month by
1999

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Anti-Flair Bracket Assembly for the Boeing Longbow Apache Helicopter



Before
5 sheet metal parts
19 rivets
20 tools needed
32 hours manufacturing



After
1 high-speed machined part
2 hours manufacturing
10% less weight
45% less cost
Tooling cost virtually eliminated

Source: Alfredo Herrera, 1998 International DFMA forum, Newport, RI

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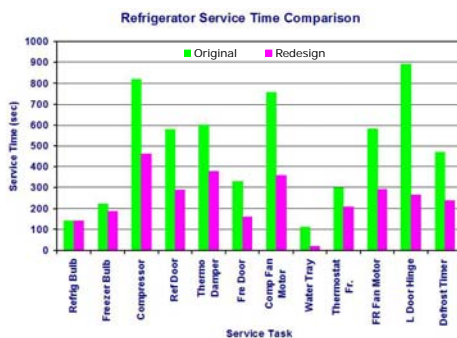
Apache Longbow Helicopter Redesign

	Original	New
Design	Sheet metal angles and extruded stiffeners attached with rivets	High speed machined parts
Parts	74	9
Weight	3 kg	2.74 kg
Fabrication	305 hr	20 hr
Manufacturing & assembly	697 hr	181 hr
Cost	\$58,000	\$15,000

New design - more rigid, more stable, easier alignment, reduced installation and inspection time

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DFS improvements...



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Summary

Purposes: The model will help you to understand IPD

Use: The model can be used as a checklist to identify the relative position of a project and any phases that may have been left out

Limitations: The model will not tell you what to do next or which phases are most important to consider

But mainly... it helps you to think in an IPD style

Meeting the learning objectives?

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Any Questions ?

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Final round-up:

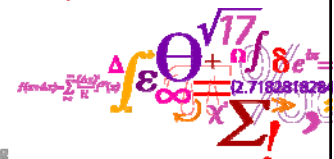
Topics covered:

Managing Innovation

The Product Development Process

Integrated Product Development

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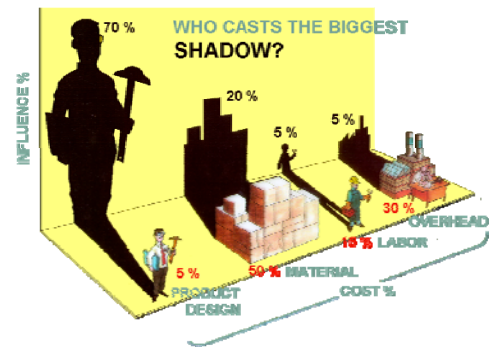
Mission Statement:



“To appreciate the considerations of **project management** in a real **organisation** where results are not just about creating new knowledge but turning it into **profitable products**.”

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Final Thought



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